

Application No. : 09/418,663
Filed : October 14, 1999

REMARKS

Claims 12-27, 40-42, 47, 48, and 60-78 were pending in the application. By this paper, Applicant has amended Claim 18, and cancelled Claims 23-27. Hence Claims 12-22, 40-42, 47-
5 48, and 60-78 are presently pending in the application.

RCE

In response to the Examiner's Final rejection of all claims, Applicant has herewith filed a Request for Continued Examination (RCE) to continue prosecution of the above-referenced
10 application.

Specific Objections

In response to the Examiner's objection noted on page 3, pars. 19 and 20 of the Office Action, Applicant has herein amended the specification to clarify the term "wizard". Contrary to
15 the Examiner's assertion in Par. 20 of the Action (and Applicant's initial understanding when drafting the application), the term "wizard" is not used by the Assignee as a trademark in the present context. Rather, the term is used a generic term referring to a class of software routines that are ubiquitous in the art. For illustration of this point, Applicant requests that the Examiner merely type in the term "installation wizard" into Google™ or a comparable Internet search
20 engine, and review the results. Applicant respectfully submits that "wizard" is a common and generic term known to those of ordinary skill in the software arts describing (generally) user-interactive routines designed to accomplish a given purpose. For example, installing new computer software, one typically encounters an installation "wizard" which guides them through the process of loading the software, accepting any licenses, etc.

25 Hence, Applicant has removed the capitalization from the term in the present application so as to show its generic quality. As the Examiner is aware, generic marks are specifically not available for registration on the principal register.

Accordingly, Applicant submits that the Examiner's objections are overcome.

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Rejections under 35 U.S.C. §103

Independent Claims 12, 18, 23, 40, 47, 48, 60, 75, 76, 77, and 78 were rejected by the Examiner under 35 U.S.C. §103, and are discussed in greater detail below.

5 Claim 12 - Claim 12 was rejected under 35 U.S.C. §103 over U.S. 6,324,678 to Dangelo ("Dangelo '678") in view of U.S. 6,378,123 to Dupenloup ("Dupenloup '123"). Applicant respectfully traverses these rejections.

10 Claim 12 as presented herein includes limitations relating to Applicant's invention operating at a high level of abstraction. As discussed (and shown via Applicant's demonstration) during the aforementioned interview, Applicant's invention operates at a high level of abstraction.

15 Applicant respectfully requests reconsideration of these rejections. The Examiner's own citation in pars. 25 and 26, page 4 of the Office Action point out the salient flaw in his argument. Specifically, the Examiner cites Dangelo '678 as progressing "from high level to low level" of abstraction (par. 25, last line). This is a mischaracterization of Dangelo, in that Dangelo specifically teaches away from high levels of abstraction (i.e., the "system concept", "algorithm", and "architecture" levels of the Smith pyramid cited by the Examiner on pages 3-4 of the Office Action). For example, the first sentence of the abstract of Dangelo '678 states the following:

"A method for generating structural descriptions of complex digital devices from high-level descriptions and specifications is disclosed." {emphasis added}

See also, for example, Col. 2, lines 46-49 of Dangelo '678, wherein it states:

"A methodology for deriving a lower-level, physically implementable description, such as a RTL description of the higher level (e.g., VHDL) description, via an intermediate rule-based tool such as Prolog, is disclosed herein." {emphasis added}

Applicant submits that the invention of Dangelo '678 is aimed only at lower levels of design abstraction. As indicated in the foregoing citation, the Dangelo '678 invention is meant to take a higher level representation (e.g., RTL or VHDL) of a design, and render a lower level description therefrom. The fact that Dangelo acknowledges that activities can occur at higher levels of

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abstraction is not the same as teaching these activities (i.e., the specific activities recited in Applicant's Claim 12). Dangelo does not teach or suggest using its disclosed methods at any level at or above the HDL/RTL level, but as unequivocally stated in the citations presented above, operates entirely below this level. Hence, the Examiner's assertion that Dangelo teaches design "from high level to low level" of abstraction (par. 25, last line) is fallacious.

Turning to page 7 of the Office Action, the Examiner's assertions in par. 54 that limitations A-D of Claim 12 "are inherently performed at a high level of abstraction" are equally fallacious, since the activities performed within Dangelo are all below the HDL/RTL level. Applicant's Claim 12 as recited specifically recites "wherein said act of creating is performed at a high level of abstraction" (the act of creating referring to A-D as noted by the Examiner). Dangelo simply does not teach performing these activities at or above the RTL/HDL as in Applicant's claimed invention. The Examiner is basically attempting to bootstrap teachings regarding low-level processes and a passing mention of higher level design processes to produce Applicant's claimed invention, and utilizing impermissible hindsight to do so.

Similarly, Dupenloup '123 teaches only low levels of abstraction. See, e.g., Fig. 1, block 102 of Dupenloup, and the corresponding discussion of Col. 1 generally, the former correlating to the "input" of the Dupenloup '123 methodology. Applicant's invention as claimed herein resides at the higher levels of abstraction; i.e., the output of Applicant's high level design process is used as an input to the Dupenloup '123 invention.

Similarly, U.S. 6,173,434 to Wirthlin ("Wirthlin '434) teaches manipulation of logic modules or blocks, entirely at a low level of abstraction. See, e.g., Col. 5, lines 14-19 of Wirthlin '434, which states:

"In the method of this invention, the development of a relocatable module also begins with the specification of the module using either a schematic diagram or text for a synthesis tool. A netlist is also produced, which can be optimized if desired. Placement and routing is also performed, as with the prior art techniques. " {emphasis added}

Furthermore, Applicant submits that none of the other references cited by the Examiner, whether alone or in combination, teach or suggest the functionality of Claim 12 as set forth herein. Applicant believes the remaining references cited by the Examiner are at best cumulative to those previously discussed herein.

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Secondary Considerations – Applicant notes that secondary considerations have long been considered probative by the U.S. Supreme Court in determining patentability. See, e.g., *Graham v. John Deere*, 383 U.S. 1 (1966), *Goodyear Tire & Rubber v. Ray-O-Vac Co.*, 321 U.S. 275 (1944), and *Eibel Process Co. v. Minnesota & Ont. Paper Co.*, 261 U.S. 45 (1923) (relating to satisfaction of long-felt need); and *Smith v. Goodyear Dental*, 93 U.S. (3 Otto) 486 (1876), and *Graham v. John Deere*, 383 U.S. 1 (1966) (relating to commercial success).

Applicant submits that its invention, as embodied in Claim 12 and other inventions claimed herein, has achieved both great commercial success and satisfied a long-felt need in the industry, both attesting to the non-obviousness of the invention(s). Specifically, before Applicant's invention (and its commercial Architect™ embodiment) was introduced, no automated and user-interactive high-level design tools were available. Dangelo '678, filed in 1996, is completely representative of the class of prior art. As discussed above, Dangelo, while referring to higher level design processes, only teaches from the HDL/RTL level down. In fact, the higher level design processes Dangelo refers to are non-automated processes that are basically manually driven, and hence very labor intensive.

Applicant's invention was at time of its introduction (here the relevant standard), groundbreaking in that it provided a substantially automated high-level design mechanism, addressing the top portions of the Smith pyramid previously cited by the Examiner. For the myriad reasons stated previously herein, one could simply not take the teachings of Dangelo (or any other at that time) and produce the elegant high-level design apparatus fielded by the Applicant hereof.

Applicant submit as evidence of the non-obviousness of the claimed invention the fact of its continued commercial success in licensing its products to a multitude of entities (see, e.g., http://www.arc.com/products/key_cust.html for a representative (partial) listing of its customers/licensees, **which notably includes LSI Logic, the Assignee of both the Dangelo '678 and Dupenloup '123 patents.**) Hence, even the creators of the Dangelo '678 and Dupenloup '123 inventions find utility for ARC's technology. Applicant submits that this carries *significant* weight in favor of patentability; why would the developers of technology that the Examiner asserts renders the inventions presented herein obvious seek to license the ARC

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technology? Applicant respectfully submits that the plain answer is that the ARC technology affords features and benefits not found in other products, aka satisfies a long-felt need, and as previously stated by Applicant, provides a higher-level complementary tool to those manufactured by others such as LSI Logic.

5 Accordingly, Applicant respectfully submits that Claim 12 as presented herein can in no way be rendered obvious by the cited art, since none of the art teaches or suggest the series of steps performed at a high level of abstraction as specifically set forth in amended Claim 12. Furthermore, Applicant has proffered significant evidence of commercial success and satisfaction of a long-felt need in support of its position that the invention of Claim 12 is non-obvious.
10 Hence, Applicant submits that Claim 12 defines patentable subject matter, and is in condition for allowance.

Since claims 13-17 depend from Claim 12, these claims are also in condition for allowance.

15 Claims 18 and 78 - Independent Claim 18 was similarly rejected by the Examiner over Dangelo '678 in light of Dupenloup '123. Claim 18 has herein been amended to include limitations that the recited computer program is adapted to receive the input relating to a constrained set of design variables relating to a basecase processor configuration from the user. See, e.g., p. 43, line 21 of the Applicant's specification as filed. Applicant believes that none of
20 the cited art teaches or suggests providing the user with a constrained set of design variables relating to a basecase processor configuration as in Applicant's claimed invention. Specifically, through use of such constraints, Applicant's invention of Claim 18 provides the user/designer with a highly stable basis for their design, such stability including functional predictability. See, e.g., page 4, lines 11-14, and page 16, lines 21-23 of Applicant's specification as filed. Stated
25 simply, such constraints provide the user/designer with a "box of parts" which are known to work together and interact with the design basis (e.g., the basecase processor core) in predictable and stable manner.

Per. par. 83 (page 10) of the Office Action, the Examiner asserts that Col. 3, line 39 of Dangelo teaches use of such a constrained set design variables. While Applicant takes issue and

disagrees with the Examiner's characterization of what Dangelo teaches, the point is rendered moot by Applicant's present amendment regarding the basecase processor configuration; Dangelo '678 in no way teaches a constrained set of variable relating to a basecase processor.

Hence, Applicant respectfully submits that Claims 18-22 distinguish over the art of record, and are in condition for allowance.

Regarding Claim 78, the Examiner's assertion on page 25, par. 280 of the Office Action that Wirthlin '434 teaches a "basecase processor configuration" is misplaced and erroneous. Specifically, the cited portions of Wirthlin are taken out of context. Wirthlin deals only with PLAs, as discussed in the passage from Wirthlin provided below {emphasis added}:

"This invention relates to digital computers and programmable logic arrays in general, and specifically to techniques for programming a programmable logic array and for implementing a dynamically-configurable digital processor, by allowing circuit modules to be dynamically relocated within a programmable logic array. ...

The design of a programmable logic array is equivalent to the construction of a digital circuit. The logical operations to be performed are produced by programming logic elements 101, and the logic elements 101 are connected by programming routing elements 102....

Recently, programmable logic arrays using switching elements controlled by static memory devices have become available. With these SRAM-based programmable logic arrays, the configuration information is written to memory elements within the programmable logic array. Those memory elements then control switching elements in key locations in the logic and routing elements of the programmable logic array. This allows for the connection (as with the metalization layer) or disconnection (as with the fuse links) of the prior programmable logic arrays, but with the ability to change the configuration of the programmable logic array at any time by simply changing the information stored in the memory elements.

Of particular interest for this invention are SRAM-based programmable logic arrays that allow the changing of only part of their configuration, without the necessity of changing the entire configuration. Such programmable logic arrays include the Configurable Logic Array (CLAy) produced by National Semiconductor, the 6200 series produced by Xilinx, and devices from Atmel."

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Hence, Wirthlin merely discloses different instructin sequences for use in a logic element-based PLA hardware device. Wirthlin operates entirely at a low level of abstraction, and hence teaches away from combination with another “low-level” reference (Dangelo ‘678) to produce the high-level invention of Applicant’s Claim 78. Neither reference teaches or suggests performance of the various elements cited by the Examiner at a high level of abstraction.

Claims 40, 47, 48, 60, 75, 76, and 77 - Independent Claims 23, 40, 47, 48, 60, 75, 76, and 77 limitations similar to those of Claim 12 discussed above, i.e., relating to a high level of abstraction. For reasons similar to those discussed with respect to Claim 12, Applicant respectfully submits that Claims 40, 47, 48, 60, 75, 76, and 77 as amended herein define patentable subject matter, and are now in condition for allowance.

Other Remarks

Applicant hereby specifically reserves its right of appeal, and the right to prosecute claims of different or broader scope in a continuation or divisional application.

Applicant notes that any cancellations or additions made herein are made solely for the purposes of more clearly and particularly describing and claiming the invention, and not for purposes of overcoming art or for patentability. The Examiner should infer no (i) adoption of a position with respect to patentability, (ii) change in the Applicant’s position with respect to any claim or subject matter of the invention, or (iii) acquiescence in any way to any position taken by the Examiner, based on such cancellations or additions.

Furthermore, the Examiner should not assume that any discussion or amendments presented above in the context of a particular claim are applicable to any other claim unless explicitly stated herein.

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If the Examiner has any questions or comments which may be resolved over the telephone, he is requested to call the undersigned at (858) 675-1670.

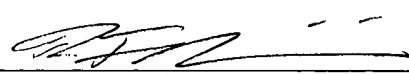
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Respectfully submitted,

GAZDZINSKI & ASSOCIATES

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